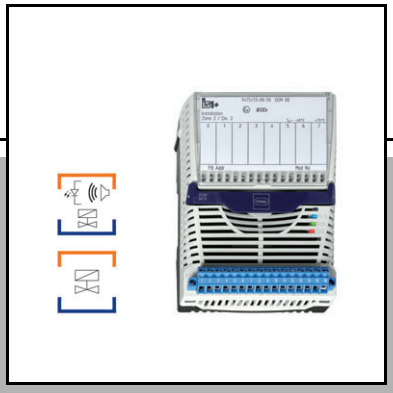

Operating instructions

Digital Output Module for Zone 2

> 9475/33-08-.0

STAHL

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2 General information

2.1 Manufacturer

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Am Bahnhof 30
74638 Waldenburg
Germany

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Internet: www.stahl-ex.com

2.2 Information regarding the operating instructions

ID-No.: 218140 / 9475612310
Publication code: 2013-05-08·BA00·III·en·00

2.3 Conformity with standards and regulations

Conformity with standards and regulations is specified in the corresponding certificates and the EC Declaration of Conformity. These documents can be downloaded from our homepage www.stahl-ex.com.

3 Symbols used

	Safety notes **Non-compliance can result in material damage, serious injuries or death.** The safety notes contained in these operating instructions and affixed to the device must be observed!
	Warning symbol Danger due to explosive atmosphere!
	Warning symbol Danger due to live components!
☞	**Note** This graphic marks important additional information, tips and recommendations.

4 General safety notes

4.1 Operating instructions storage

Read these operating instructions carefully and store them near the installation place. For correct operation, please observe all other documents enclosed in this delivery and the operating instructions of the equipment to be connected.

4.2 Safety notes

⚠ WARNING	
	Use the devices only for their intended purpose! ▶ We cannot be held liable for damage caused by incorrect or unauthorized use or by non-compliance with these operating instructions. ▶ Use the device only if it is undamaged and clean.

⚠ WARNING	
	Any unauthorized work on the device is prohibited! Installation, maintenance, overhaul and repair may only be carried out by authorized and appropriately trained personnel.

Observe the following information during installation and operation:

- ▶ Any damage can invalidate the explosion protection
- ▶ National and local safety regulations
- ▶ National and local accident prevention regulations
- ▶ National and local assembly and installation regulations
- ▶ Generally recognized technical regulations
- ▶ Safety notes in these operating instructions
- ▶ Characteristic values and rated operating conditions on the rating plates and data plates
- ▶ Additional information plates on the devices

Additional safety notes:

- The digital output module Type 9475/33-08 is approved for use in gas hazardous areas of Zone 2 and in the safe area.
- The digital output module Type 9475/33-08 is approved for use in dust hazardous areas of Zone 21 and Zone 22.
- For operation in gas or dust hazardous areas, the module must be installed in an enclosure which fulfils the requirements of IEC/EN 60079-0.
- The module must be mounted on the BusRail 9494 only.
- A distance of 50 mm must be maintained between intrinsically safe and non-intrinsically safe electric circuits.
- Modules with intrinsically safe and non-intrinsically safe field circuits may be operated simultaneously on one BusRail. In this case, a distance of 50 mm must be maintained between the terminals of intrinsically safe and non-intrinsically safe electric circuits (e.g. partition 220101 or empty space).
- The safety-related maximum values of the connected field devices must match the values of the modules according to data sheet, operating instructions and EC Type Examination Certificate.
- Interconnections of several active intrinsically safe circuits can result in different safety-related maximum values. This can endanger the intrinsic safety so that an appropriate proof must be provided.
- Modules and plug connectors may be connected and disconnected during operation in hazardous areas (hot-swap und hot-plug).
- To avoid electrostatic charging, the modules in hazardous areas must be cleaned only with a moist cloth.

4.3 Alterations and modifications

⚠ WARNING	
	Alterations and modifications to the device are not permitted. We shall not accept any liability or warranty obligations for damage resulting from alterations and modifications.

4.4 Special versions

In case of additional/different order options, special versions may differ from the description given here.

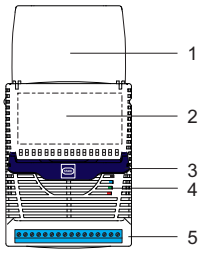
5 Intended use

The digital output module is used for connecting of up to 8 intrinsically safe solenoid valves, indication or signal elements to the IS1 remote I/O system. All channels are individually monitored for wire breakage and short-circuit. The Ex i outputs are short-circuit proof, galvanically connected to each and galvanically separated from the system.

Compatible spare for IS1 I/O modules:
Series 9475/12-08-51, 9475/12-08-61, 9475/22-08-51 (without Plant STOP), 9475/22-08-61 (without Plant STOP)

6 Components

6.1 Overview



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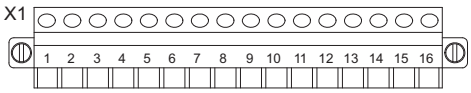
1	Operating flap with insert label (open) and connection diagram
2	Module data (serial number, hardware revision number, software revision number, manufacturing date, e.g.: 123456DE9999 Rev.A 01-01 0508)
3	Notch lever for removing the module from the BusRail
4	LED for operation indication ("RUN", green), error ("ERR", red) and maintenance ("M/S", blue) (for further information, see "LED indications and troubleshooting")
5	Pluggable terminal X1

6.2 Pluggable terminal X1

For the module, a pluggable terminal X1 (screw-type terminal 162702 or spring clamp terminal 162695) for connection of field devices is available as accessory (not included in the scope of delivery of the module!).
The pluggable terminal X1 has 16 terminals for connection of the field cables.



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Terminal assignment

	X1 output signals
Channel	Terminals
0	1(+), 2(-)
1	3(+), 4(-)
2	5(+), 6(-)
3	7(+), 8(-)
4	9(+), 10(-)
5	11(+), 12(-)
6	13(+), 14(-)
7	15(+), 16(-)

7 Technical data

Explosion protection

Global (IECEx)

Gas and dust: IECEx DEK 12.0070X
Ex nA ia [ia Ga] IIC T4 Gc
[Ex ia Da] IIIC

Europe (ATEX)

Gas and dust: DEKRA 12 ATEX0232X
⟨Ex⟩ II 3 (1) Ex nA ia [ia Ga] IIC T4 Gc
⟨Ex⟩ II (1) D [Ex ia Da] IIIC

Certificates and approvals

Certificates: IECEx, ATEX

Further parameters

Installation: in Zone 2, Zone 21, Zone 22 and in the safe area

Safety data

Version: **9475/33-08-50**

Max. voltage U_o: 19.4 V

Output ia

Max. current I_o: 143 mA

Max. power P_o: 692 mW

Max. connectable inductance L_o/capacity C_o

IIC	L_o [mH]	1.44	1.4	0.65	0.5	0.2	0.1	0.05
	C_o [nF]	--	103	113	113	153	183	227
IIB / IIIC	L_o [mH]	7.5	5.0	2.0	0.5	0.2	0.1	0.02
	C_o [nF]	673	883	943	943	1083	1283	1493

Output ib

Max. current I_o: 37.8 mA

Max. power P_o: 506 mW

Max. connectable inductance L_o/capacity C_o

IIC	L_o [mH]	6.3	2.0	0.65	0.5	0.2	0.1	0.05
	C_o [nF]	113	113	123	123	153	193	227
IIB / IIIC	L_o [mH]	58	20	10	5.0	0.2	0.1	0.02
	C_o [nF]	363	723	953	963	1083	1283	1493

Max. internal capacity C_i: 16.5 nF (in the above tables, C_i is subtracted from C_o)

Max. internal inductance L_i: negligible

Version	**9475/33-08-60**
Max. voltage U_o	25.7 V
Output ia	
Max. current I_o	107 mA
Max. power P_o	688 mW
Max. connectable inductance L_o/capacity C_o	

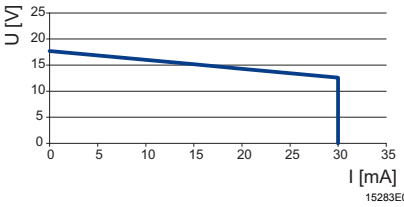
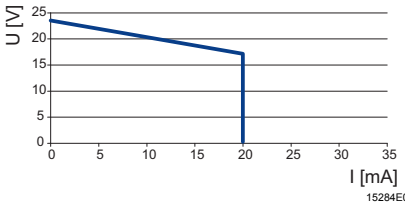
IIC	L_o [mH]	1.57	1.1	1.0	0.9	0.5	0.2	0.1
	C_o [nF]	--	49	52	54	69	95	97
IIB / IIIC	L_o [mH]	11	5.0	1.0	0.5	0.2	0.1	0.05
	C_o [nF]	335	335	395	485	635	785	785

Output ib	
Max. current I_o	26.3 mA
Max. power P_o	468 mW
Max. connectable inductance L_o/capacity C_o	

IIC	L_o [mH]	7.0	5.0	2.0	1.0	0.5	0.2	0.05
	C_o [nF]	32	36	49	64	81	97	97
IIB / IIIC	L_o [mH]	100	50	1.0	0.5	0.2	0.1	0.05
	C_o [nF]	245	365	425	505	655	785	785

Max. internal capacity C_i	5.2 nF (in the above tables, C_i is subtracted from C_o)
Max. internal inductance L_i	negligible

Electrical data

Version	**9475/33-08-50**	**9475/33-08-60**
Ex i outputs		
Number of channels	8	8
Open-circuit voltage	17.5 V	23.5 V
Output nominal current	30 mA	20 mA
Internal resistance	170 Ω	315 Ω
Rated operation		
U	12.6 V	17.5 V
I	30 mA	20 mA
Output characteristic		

Galvanic separation	
Test voltage	
acc. to standard	EN 60079-11
Between auxiliary power/ system components	≥ 1500 V AC
Between two I/O modules	≥ 500 V AC
Between I/O channels/ system components	≥ 500 V AC
Between I/O channels/ ground (PA)	≥ 500 V AC
Electromagnetic compatibility	Tested to the following standards and regulations: EN 61326-1 (2006) IEC 61000-4-1 … 6, NAMUR NE 21
Electrical connection	
Power supply	BusRail Types 9494
Ex i field signals	Pluggable, blue terminals, 16-pole, 2.5 mm^2, screw- or spring-type versions with lock
Auxiliary power	
Version	Intrinsically safe Ex ia via BusRail
Behaviour during undervoltage	all outputs "OFF"

Max. current consumption	250 mA	240 mA
Max. power consumption	6 W	5.8 W
Max. power dissipation	4.8 W	4 W

Device-specific data	
Settings	
Module	
Diagnosis messages	ON / OFF
Signal	
Power error control	ON / ON without test current / OFF
Behaviour in case of error	ON / OFF / hold last value
Ambient conditions	
Ambient temperature	-40 … +75 °C
Storage temperature	-40 … +80 °C
Maximum relative humidity	95 % (without condensation)
Semi-sinusoidal shock (IEC EN 60068-2-27)	15 g (3 shocks per axis and direction)
Sinusoidal vibration (IEC EN 60068-2-6)	1 g in the frequency range 10 ... 500 Hz 2 g in the frequency range 45 ... 100 Hz
Mechanical data	
Degree of protection (IEC 60529)	IP20
Module enclosure	polyamide 6GF
Fire resistance (UL 94)	V2
Pollutant class	corresponds to G3
Dimensions	L = 128 mm, W = 96.5 mm, H = 67 mm
Indication	
LED indication	
Module requires maintenance	LED "M/S", blue
Operating state	LED "RUN", green
Group error	LED "ERR", red
Function indication	
Retrievable parameters	Manufacturer, Type, hardware revision, software revision, serial number
Error indication	
Module status and alarms	• Internal bus error primer / redundant • No response from IOM • Configuration does not correspond to module • Hardware error • Excess temperature • Slot error • Module requires maintenance
Signal errors for each channel	
Signal status bit	"0" = output high-impedance / "1" = output is supplied
Wire breakage output	> 12 kΩ (with deactivated test current can be detected only if the output is switched on)
Short circuit output	< 30 Ω (response range 30 ... 60 Ω) (can be detected only if the output is switched on)
Mounting / installation	
Mounting orientation	horizontal or vertical (see chapter 9.3)
Mounting type	on 35 mm DIN rail LV 35/15 (DIN EN 60715)

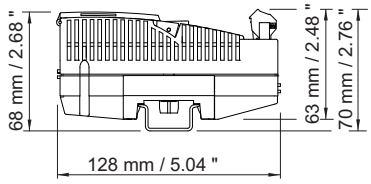
8 Transport and storage

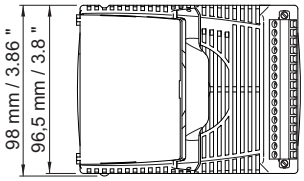
- ▶ Transport and storage are only permitted in the original packaging.
- ▶ The devices must be stored in a dry place and vibration-free.

9 Installation

9.1 Dimensions / fastening dimensions

Dimensional drawings (all dimensions in mm / inches) - subject to modifications





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9.2 Installation conditions

⚠ WARNING
The national installation instructions (e.g. IEC/EN 60079-14) must be observed. Ensure that there is a distance of at least 50 mm (safety distance) between connecting units of intrinsically safe and non-intrinsically safe circuits!

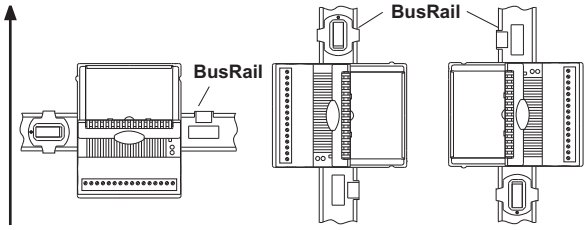
⚠ WARNING
If the installation has strong electromagnetic sources of interference, use of shielded field cables is recommended. In this case, the shield must be connected to the equipotential bonding of the hazardous area! For this purpose, the shields of the field wiring must be connected to the shield busses installed in the enclosure as close to the entry point as possible! The shield busses must be also connected to the mounting plate close to the entry point of the field wiring using the shortest possible way!

9.3 Mounting and operating position

Mounting the module on BusRail

NOTICE	
☞	The module and the pluggable terminal X1 can be safely connected or disconnected during operation in the hazardous area (hot swap).

NOTICE	
☞	Module operation is permitted only in the following mounting positions: Vertical mounting with pluggable terminals below, on the left or right.



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- ▶ Position the module vertically on the provided slot of the BusRail
- ▶ Snap module into place by slightly pressing it

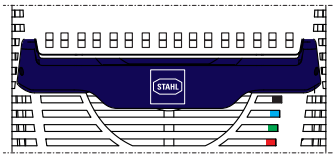
Connecting field devices to the module

NOTICE	
☞	The mounting can be carried out with connected or disconnected terminals. In the operating flap, there is a insert label which can be used for entering the assignment of the field devices to the channels. Labelling of the insert label can be performed, for example by means of the IS Wizard.

- ▶ Connect field devices to terminal X1 according to terminal assignment (see on the front or on insert label under the operating flap) (tightening torque for screw-type terminals 0.5 ... 0.6 Nm)
- ▶ Place the field wiring shields (if present) as close to the entry point on the grounding rail as possible
- ▶ Plug the pluggable terminal X1 into the module and secure it against loosening using safety screws (tightening torque 0.5 ... 0.6 Nm)
- ▶ Mount partition if necessary (distance between intrinsically safe and non-intrinsically safe electric circuits at least 50 mm)

9.4 LED indications and troubleshooting

Meaning of the LEDs



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- LED "RUN", green = operation indication
- LED "ERR", red = module error indication
- LED "M/S", blue = requires maintenance or outside specification

Indication overview

	Module state	Error source	Possible solution
LED "RUN", green			
ON	Normal operation	--	--
FLASHES	In standby (switched on but no data exchange with master yet)	The module is in proper condition but is not ready for cyclic data exchange yet (there is no parameter set available yet). Outputs in a state without power.	• Activate the cyclic data transfer with the master • Check master, bus connection and CPM
OFF	No function	No supply voltage at the I/O module or I/O module is defective.	• Check system supply • Check CPM or CPU&PM • Check the BusRail • Engage the I/O module correctly on the BusRail • Replace the I/O module
LED "ERR", red			
OFF	No error	--	--
FLASHES	External error	Error in the field circuit: wire breakage, short circuit	• Eliminate the cause in the indicated field circuit, check electric lines and field device
	Incorrectly configured module	Configuration is not correct or a wrong module is connected	• Change configuration in the automation system or connect the correct module
	Outputs in safety position	Cyclic data transfer with the automation system has been interrupted	• Check the cyclic data transfer of CPM or CPU (LCD or LED "RUN") • Check bus connection • Activate the cyclic data transfer with the automation system
ON	Module error	Module is defective	• Replace the module
LED "M/S", blue			
OFF	Normal operation	--	--
FLASHES	External maintenance required	Ambient temperature is outside the specification	• Reduce ambient temperature by means of, e.g. shading or cooling **Note: If the problem is not eliminated, the module will be permanently damaged**
ON	Maintenance required	Slot error or module is damaged by excess temperature or end of the service life reached	• Replace the module as soon as possible within the next 12 months, otherwise there is a risk of module failure

9.5 Dismounting / replacement of the module

WARNING
If a partition is mounted, first pull out terminal X1 from the module to be replaced.

NOTICE
☞ When replacing the module by a module identical in construction, the set parameters are maintained. No further user adjustments are necessary. When replacing the module by a module with a different function, the module reports a configuration error (red LED "ERR" flashes). The module must be either re-parameterised or it is necessary to use a module of the correct type.

NOTICE
☞ If an IS1 module is replaced by an IS1+ module with the same functions, the IS1+ module functions in the compatibility mode (= identical functionality). If new IS1+ functions must be used, it may be necessary to update the software of CPM 9440 or CPU 9441. In case of PROFIBUS DP operation, a new GSD may be required. If required, contact your responsible distributor for further information.

- Loosen safety screws of the pluggable terminal X1
- Pull out the terminals from the module
- If necessary, remove the partition
- Pull the blue notch lever of the module upwards to unlock the module
- Remove the module vertically from the BusRail
- Position the new module vertically onto the BusRail and snap into place by slightly pressing it
- If necessary, snap partition into place between modules
- Plug the pluggable terminal X1 into the module and secure it against loosening using screws (tightening torque 0.5 ... 0.6 Nm)

10 Maintenance, overhaul and repair

10.1 Maintenance

The module does not require regular maintenance.

- ▶ Observe the function according to the intended use
- ▶ Follow the directives according to IEC/EN 60079-17
- ▶ Adhere to permissible temperatures according to IEC/EN 60079-0

NOTICE	
☞	If the blue LED "M/S" lights up continuously, it is recommended to replace the module in the foreseeable future. Otherwise there is a high probability that the module will fail in 12 months (see "LED indications and troubleshooting").

10.2 Repair instructions

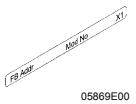
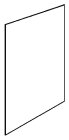
NOTICE	
☞	Repair must be performed by the manufacturer only! When repair is required, send the module to your responsible sales organization (for the address, see chapter 2.1).

11 Disposal

- ▶ Observe the national waste disposal regulations.

12 Accessories and spare parts

⚠ WARNING	
	Explosion hazard due to wrong or insufficient spare parts or wrong accessories! For components with relevant Ex protection, use only suitable, certified spare parts or corresponding accessories of R. STAHL Schaltgeräte GmbH or other manufacturers. Otherwise, explosion protection cannot be guaranteed any longer. R. STAHL Schaltgeräte GmbH cannot be held liable for damage caused by ignoring this danger.

Designation	Figure	Description	Art. no.	Weight kg
Plug-in terminal	02079E00	2.5 mm^2 with lock, 16-pole, screw connector, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits Labelling: 1 ... 16	162702	0.028
	02077E00	2.5 mm^2 with lock, 16-pole, spring clamp connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits, incl. test jacks Labelling: 1 ... 16	162695	0.028
mA - Isolating Repeater	10389E00	The mA isolating repeaters are used for the connection of 4-wire transmitters to active 2-wire inputs and for the galvanic separation. Input: sink, Ex e Output: sink, Ex i	160166	0.107
	04653E00	The mA isolating repeaters are used for the connection of 4-wire transmitters to active 2-wire inputs and for the galvanic separation. Input: sink, Ex i Output: sink, Ex i	160165	0.075
Labelling strips	 05869E00	"FB Addr ... Mod No ..." for pluggable terminal, sheet with 26 strips	162788	0.001
DIN A4 sheet	 09900E00	For label plate on I/O modules; 6 labels on each sheet; print-out using IS Wizard; packaging unit = 20 sheets	162832	0.001
Partition	15196E00	For mounting between intrinsically safe and non-intrinsically safe connections of the I/O modules, in order to adhere to the required 50 mm distance	220101	0.000
Warning sign	05872E00	"Clean modules only with a damp cloth."	162796	0.001

13 EC Declaration of Conformity

EG-Konformitätserklärung
EC Declaration of Conformity
Déclaration de Conformité CE

R. STAHL Schaltgeräte GmbH • Am Bahnhof 30 • 74638 Waldenburg, Germany
erklärt in alleiniger Verantwortung, *declares in its sole responsibility, déclare sous sa seule responsabilité,*

dass das Produkt: *that the product:* *que le produit:*	**Digital Output Modul** *Digital Output Module* *Module de sortie numérique*
Typ(en), *type(s), type(s):*	**9475/33-08-e0 (e = 5, 6)**

mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt.
is in conformity with the requirements of the following directives and standards.
est conforme aux exigences des directives et des normes suivantes.

Richtlinie(n) *Directive(s)* *Directive(s)*	**Norm(en)** *Standard(s)* *Norme(s)*
94/9/EG: ATEX-Richtlinie *94/9/EC: ATEX Directive* *94/9/CE: Directive ATEX*	EN 60079-0: 2012 EN 60079-11: 2012 EN 60079-15: 2010
Kennzeichnung für, *marking for, marquage pour:* **9475/33-08-*0**	**Ⓔx II 3 (1) G Ex nA ia [ia Ga] IIC T4 Gc** **II (1) D [Ex ia Da] IIIC** **CE 0158**
EG-Baumusterprüfbescheinigung: *EC Type Examination Certificate:* *Attestation d'examen CE de type:*	**DEKRA 12 ATEX 0232 X** (DEKRA Certification B.V., Utrechtseweg 310, 6812 AR Arnhem, The Netherlands)
2004/108/EG: EMV-Richtlinie *2004/108/EC: EMC Directive* *2004/108/CE: Directive CEM*	EN 61326-1: 2006
Sonstige Normen: *Other Standards:* *Autres normes:*	EN 50178: 1997 EN 61010-1: 2010

Waldenburg, 29.04.2013 — **Ort und Datum** *Place and date* *Lieu et date*

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Director R&D Automation
Directeur R&D Automation

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Leiter Qualitätsmanagement
Director Quality Management
Directeur Assurance de Qualité

F-4174-601 01/2011 STMZ

9475 6 002 003 0_00

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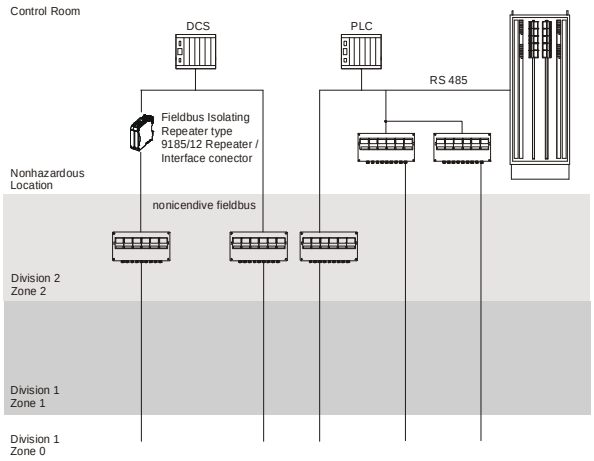
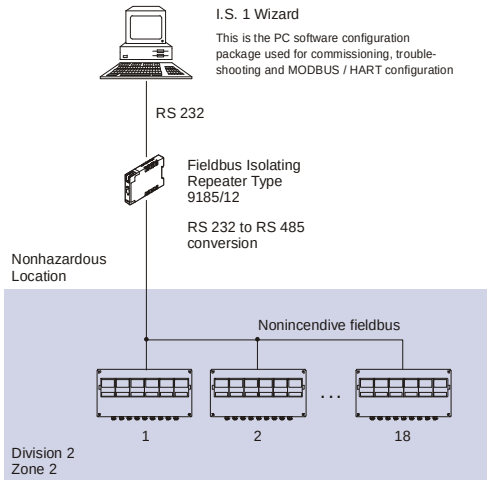
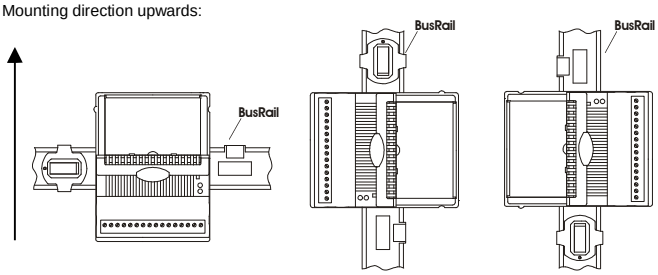


Example: System Topology interfacing Automation control systems with DIV 2 / Zone 2 Installation of IS1 resp. IS1+ Remote I/O System



Service Bus with Isolating Repeater interface

Mounting direction upwards:



The IS1 resp. IS1+ Remote I/O is a DIN rail mounted system designed to record and output process control signals between hazardous location transducers and sensors and a nonhazardous location automation system. It consists of electrical apparatus in the nonhazardous, Class I, Division 2 or Class I, Zone 2 hazardous locations linked by either nonincendive field bus or a field bus installed per the National Electrical Code, ANSI/NFPA 70 Article 500.

The nonincendive field bus circuit is achieved with the use of the Fieldbus Isolating repeater type 9185. This device resides in the nonhazardous location and provides a nonincendive field bus circuit for connection to the IS1 resp. IS1+ Remote I/O System. See example to the left.

The apparatus located in the Division 2 or Zone 2 hazardous location are referred to as Remote I/O, and consist of the following major subsystems.

1. <u>CPU & Power Module or CPU Module, Power Module & Socket</u>
   The CPU & Power Module or the Power Module serves as a power supply unit for its CPU unit or the CPU Module, as well as for the supply to the I/O Modules and the field circuits. The power supply to the I/O modules is implemented via the BusRail. For the configuration with a redundant CPU and Power Module the power supply to the I/O modules is decoupled with diodes. The power supply unit has an under voltage monitoring circuit. The CPU fulfils the function of a gateway between the internal bus of an IS1 field station and the fieldbus which connects the field station with the automation system. The gateway is constructed as a dual processor system. The I/O processor controls the data exchange with the I/O modules and, when plugged-in, with the redundant CPU & Power Module. The communication processor controls the data exchange on the fieldbus and on the Service Bus.

2. <u>BusRail</u>
   The BusRail provides a Power bus, an internal data bus and the address lines for the interconnection of the CPU & Power Supply to Remote I/O modules The Power bus distributes power supplied by the CPU & Power Module to the I/O Modules plugged to the BusRail. The communication with the I/O Modules is implemented via the address and date bus lines. The interface of the CPU & Power Module with the internal data bus on the BusRail is designed with redundancy.

3. <u>Components of Remote I/O System</u>
   All I/O Modules are manufactured in a unique DIN rail mount package which then mounts onto the Remote I/O system BusRail. All I/O Modules provide galvanic isolation between the field circuits and the BusRail's circuits.

4. Refer to pages 3 through 26 for information specific to each module.

GENERAL NOTES:

1. Installation should be in accordance with Article 504/505 of the National Electrical Code, ANSI/NFPA 70 and ANSI/ISA RP12.06.01 resp. with the Canadian Electrical Code, Part I.
2. Use a general purpose enclosure meeting the requirements of ANSI/ISA S82 for use in nonhazardous or Class I, Division 2 hazardous (Classified) Locations.
3. Use an FMRC Approved or NRTL listed Dust-ignition proof enclosure appropriate for environment protection in Class II, Division 1, Groups E, F and G; and Class III, hazardous (Classified) Locations.
4. All I/O Modules may be detached from the BusRail or plugged onto it during operation in hazardous areas.
5. The Modules may be operated in one of the three mounting positions only.

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			2013	Date	Name	Certification drawing	Scale: none
			drawn	08.02.	Reistle	**IS1 resp. IS1+ Remote I/O System for CL I, DIV 2 / Zone 2 Overview**	
			checked		Kaiser		Sheet: 1 of 30
02	26.02.2014	Bagusch				9400 6 031 002 1	Agency: FM
01	17.02.2014	Bagusch					
Version	Date	Name				Ers. f. / Ers. d.	A4

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Nonhazardous
Class I, II, III, Division 2, Group A-G
or Class I, Zone 2, Group IIC/IIB
Hazardous (Classified) Locations

Input for "Plant-stop"
only at type 9475/3*-0*-*2

FM approved intrinsically safe
solenoid valves, indicating lamps

The Type 9475 Digital Output Module is designed to receive a digital signal from the IS1 CPU & Power Module and output a corresponding discrete signal to solenoid valves, LED initiators and audible alarms. The module is nonincendive for installation in a Class I, II, III, Division 2, Group A-G or Class I, Zone 2, Group IIC/IIB hazardous location according to NEC Article 504/505 and provides intrinsically safe connections for Class I, Division 1, Groups A-G or Class I, Zone 0, Group IIC/IIB hazardous locations.

Entity parameters for wiring configuration to the left are as follows:

CL I,II,III, DIV 1, Group A-G or CL I, Zone 0, Group IIC

	V_{OC} [V]	I_{SC} [mA]	P_O [mW]	Ci [nF]	Li [mH]
9475/3*-04-1*	19.7	142	698	11	0
9475/3*-04-2*	25.7	110	708	7.2	0
9475/3*-04-3*	26.0	90	585	5.2	0
9475/3*-08-4*	11.5	74.8	216	5.2	0
9475/3*-08-5*	19.4	143	692	16.5	0
9475/3*-08-6*	25.7	107	688	5.2	0

CL I,II,III, DIV 1, Group A-G or CL I, Zone 1, Group IIC

	V_{OC} [V]	I_{SC} [mA]	P_O [mW]	Ci [nF]	Li [mH]
9475/3*-04-1*	19.7	53.8	617	11	0
9475/3*-04-2*	25.7	49.5	648	7.2	0
9475/3*-04-3*	26.0	50.4	508	5.2	0
9475/3*-08-4*	11.5	39.2	194	5.2	0
9475/3*-08-5*	19.4	37.8	506	16.5	0
9475/3*-08-6*	25.7	26.3	468	5.2	0
9475/3*-04-7*	15.4	115.4	1475	33	0

"Plant-stop I" at 9475/33-0*-*2 only, Connection X3
CL I,II,III, DIV 1, Group A-G or CL I, Zone 0, Group IIC

Terminal 1(+),24(-) (3-4 open)	V_{OC} [V]	I_{SC} [mA]	P_O [mW]	Ci [µF]	L_i [mH]
9475/3*-0*-*2	5.1	0.44	0.50	5.2	0

"Plant-stop II" at 9475/3*-0*-*2 only, Connection X3
CL I,II,III, DIV 1, Group A-G or CL I, Zone 0, Group IIC

Terminal 3(+), 4(-) (1-2 open)	V_i [V]	Ri [Ω]	Ci [nF]	L_i [mH]
9475/3*-0*-*2	30	4940	0	0

Wiring legend
Connection allocation – Digital Output Module Type 9475/3*-0*-**

DOM (8 channels) 9475/3*-08-** Channel no.	DOM (4 channels) 9475/3*-04-** Channel no.	Connection X1 Terminal no.
0	0	1(+), 2(-)
1	-	3(+), 4(-)
2	1	5(+), 6(-)
3	-	7(+), 8(-)
4	2	9(+), 10(-)
5	-	11(+), 12(-)
6	3	13(+), 14(-)
7	-	15(+), 16(-)

Notes:
1. Intrinsically safe apparatus shall be LEDs or an FM approved System or Entity device connected in accordance with the manufacturer´s installation instructions.
2. For Entity concept use the appropriate parameters from above to ensure the following:
   V_{OC} or $V_t \leq V_{max}$ $\quad C_a \geq C_i + C_{leads}$
   I_{SC} or $I_t \leq I_{max}$ $\quad L_a \geq L_i + L_{leads}$
3. Capacitance and Inductance values for circuit with concentrated inductors and capacitors for each type 9475/3* are on sheet 21 and 22.
4. Suitable separation must be maintained between wiring of each I.S. input channel.
5. Suitable separation must be maintained between non I.S. / AEx nA wiring of the input circuits and I.S. wiring of other I/O modules and of the IS1 resp. IS1+ system. Use partition (SAP No. 220101) for separation from I/O modules with I.S. circuits. Do not carry out work at the terminals without the partition plate in place.
6. General Notes (see Page 1)

WARNING: Substitution of components may impair Intrinsic Safety.
AVERTISSEMENT: Substitution de composants peut compromettre la sécurité intrinsèque.

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Transferring the text, editorial changes of equivalent meaning are allowed.

			2013	Date	Name	Certification drawing	Scale
			drawn	08.02.	Reistle	**Digital Output Module Type 9475/3b-**-** (b = 2 or 3)**	none
			checked		Kaiser		Sheet 20 of 30
02	26.02.2014	Bagusch			STAHL	9400 6 031 002 1	Agency FM
01	17.02.2014	Bagusch					
Version	Date	Name				Ers. f. / Ers. d.	A4

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The internal capacitance per channel is already taken into account in the Lo and Co values shown in the tables below. The internal inductance is negligibly small.

Type 9475/3*-04-1* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
1.3	99	7.5	669
1.1	109	5.0	879
-	-	2.0	889
0.5	119	0.5	889
0.2	149	0.2	989
0.1	189	0.1	1189
≤ 0.05	220	≤ 0.05	1439

Type 9475/3*-08-4* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
7.9	285	34.0	1195
5.0	395	20.0	1695
2.0	585	10.0	2195
1.0	735	5.0	2695
0.5	905	1.0	4295
0.2	1195	0.2	6995
≤ 0.05	1635	≤ 0.02	11195

Type 9475/3*-04-2* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
1.45	-	10.0	323
0.75	56	5.0	323
0.5	67	2.0	333
0.37	76	1.0	393
0.2	93	0.5	473
0.1	95	0.2	633
≤ 0.05	95	≤ 0.1	783

Type 9475/3*-08-5* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
1.44	-	7.5	673
1.4	103	5.0	883
0.65	113	2.0	943
0.5	113	0.5	943
0.2	153	0.2	1083
0.1	183	0.1	1183
≤ 0.05	227	≤ 0.02	1493

Type 9475/3*-04-3* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
2.44	-	16.0	335
2.2	39	10.0	335
1.0	55	2.0	345
0.5	71	1.0	395
0.38	79	0.5	475
0.2	94	0.2	625
≤ 0.05	94	≤ 0.1	765

Type 9475/3*-08-6* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
1.57	-	11.0	335
1.1	49	5.0	335
1.0	52	1.0	395
0.9	54	0.5	485
0.5	69	0.2	635
0.2	95	0.1	785
≤ 0.1	97	≤ 0.05	785

Type 9475/3*-0*-*2,
"Plant-stop I" Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
100	2195	100	9995
10	2595	10	12995
2.0	3295	2.0	16995
1.0	3695	1.0	19995
0.2	5495	0.2	31995
≤ 0.01	15995	≤ 0.01	159995

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			2013	Date	Name	Certification drawing	Scale
			drawn	08.02.	Reistle	**Digital Output Module**	none
			checked		Kaiser	**Type 9475/3b-**-** (b = 2 or 3)**	Sheet
						(continued from sheet 20)	21 of 30
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The internal capacitance per channel is already taken into account in the Lo and Co values shown in the tables below. The internal inductance is negligibly small.

Type 9475/3*-04-1* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
3.1	109	27.0	499
2.0	109	20.0	609
0.6	119	10.0	869
0.5	119	5.0	899
0.2	149	0.2	1089
0.1	189	0.1	1189
≤ 0.05	220	≤ 0.05	1439

Type 9475/3*-04-2* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
1.5	43	24.0	333
1.0	51	20.0	333
0.86	55	2.0	343
0.5	69	1.0	393
0.37	76	0.5	483
0.2	93	0.2	633
≤ 0.1	95	≤ 0.1	783

Type 9475/3*-04-3* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
3.4	35	32.0	345
2.4	41	20.0	345
2.0	44	1.0	405
1.0	57	0.5	485
0.5	73	0.2	635
0.39	80	0.1	765
≤ 0.2	94	≤ 0.05	765

Type 9475/3*-04-7* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
0.11	257	2.9	1467
0.1	267	2.0	1767
-	-	1.0	2367
0.05	337	0.5	2667
0.02	477	0.05	2767
≤ 0.01	488	≤ 0.02	3157

Type 9475/3*-08-4* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
22.0	155	100.0	565
10.0	345	50.0	1295
5.0	475	20.0	1895
2.0	635	5.0	2895
1.0	775	1.0	4395
0.5	935	0.2	6995
≤ 0.05	1635	≤ 0.02	11195

Type 9475/3*-08-5* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
6.3	113	58.0	363
2.0	113	20.0	723
0.65	123	10.0	953
0.5	123	5.0	963
0.2	153	0.2	1083
0.1	193	0.1	1283
≤ 0.05	227	≤ 0.02	1493

Type 9475/3*-08-6* Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
7.0	32	100.0	245
5.0	36	50.0	365
2.0	49	1.0	425
1.0	64	0.5	505
0.5	81	0.2	655
0.2	97	0.1	785
≤ 0.05	97	≤ 0.05	785

Type 9475/3*-04-7* remaining capacitance and inductance values taking into account the cable connected

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC When using cables with a line length < 700m, with L_c ≤ 1 µH/m, C_c ≤ 200 pF/m and R_c ≥ 10.76 mΩ/m		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC When using cables with a line length < 2000m, with L_c ≤ 1 µH/m, C_c ≤ 200 pF/m and R_c ≥ 10.76 mΩ/m	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
≤ 0.05	217	2.0	1667
		1.0	2367
		0.5	2667
		≤ 0.02	3967

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			2013	Date	Name	Certification drawing	Scale
			drawn	08.02.	Reistle	**Digital Output Module Type 9475/3b-**-** (b = 2 or 3) (continued from sheet 21)**	none
			checked		Kaiser		Sheet 22 of 30
02	26.02.2014	Bagusch				9400 6 031 002 1	Agency FM
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